

REMARKS

Claims 1-58 are pending in the application.

Claims 1-58 stand rejected.

Claims 1, 9, 17, 24, 32, 40 and 48 have been amended.

Claims 8, 16, 23, 31, 39, 47, 55 have been cancelled.

Rejection of Claims under 35 U.S.C. §102

Claims 1-58 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Uga, et al., U.S. Patent No. 6,718,326 B2 (Uga)

While not conceding that the cited reference qualifies as prior art, but instead to expedite prosecution, Applicant has chosen to respectfully disagree and traverse the rejection as follows. Applicant reserves the right, for example, in a continuing application, to establish that the cited reference, or other references cited now or hereafter, do not qualify as prior art as to an invention embodiment previously, currently, or subsequently claimed.

At the outset, while maintaining points made in earlier Office Action responses, Applicant respectfully notes the fundamental structure of the invention, as claimed in amended independent claims 1, 9, 17, 24, 32, 40 and 48, is generally directed to methods, systems network elements and so on, that employ a content-addressable memory that, when presented with information from a packet, in turn presents an index to a multi-feature classification memory, in which each of the multi-feature packet processing rules is formed by merging a plurality of features from a feature hierarchy. Further, each of the features is defined in the feature hierarchy, and at least one of the features in the feature hierarchy comprise another of the features in the feature hierarchy.

Each of these memories stores respective information regarding the processing of a packet (an index into the multi-feature classification memory, in the case of the content-addressable memory, and one or more multi-feature packet processing rules stored in the multi-feature classification memory. The creation and storage of multi-feature packet processing rules differs markedly from anything taught in Uga or known in the art at the time of invention.

Thus, according to the claimed invention (as claimed in amended independent claims 1, 9, 17, 24, 32, 40 and 48), providing the first memory (e.g., the content-addressable memory) with information from a packet allows the first memory (e.g., the content-addressable memory) to provide an index that is then used to access one or more corresponding multi-feature packet processing rules stored in the second memory (e.g., the multi-feature classification memory). In so doing, the network device employing the claimed invention can then use appropriate ones of its features to perform appropriate processing on the packet. Advantageously, the claimed multi-feature classification memory is configured to store multi-feature packet processing rules, which are formed by merging a plurality of features from a feature hierarchy, wherein each of the features is defined in the feature hierarchy, and at least one of the features in the feature hierarchy comprise another of said features in the feature hierarchy. Thus, by using the claimed feature hierarchy:

“The multi-feature CM eliminates the need for individual associated CMs.

The memory space in the multi-feature CM is shared by various feature rules.”

(Specification, p. 4, ll. 13-15)

As also noted in the Specification:

“Various features implemented in a router can be organized into a feature hierarchy. The feature hierarchy can be based on various user application related factors (i.e., e.g., per entry implementation cost, functionality, subsumability of the feature or the like). According to one embodiment of the present invention, features that require complex packet-processing rules (e.g., full functionality features such as statistics, policing, redirection or the like) and can subsume simple features (e.g., ACL or the like) are considered at the top of the feature hierarchy. Other forms of feature hierarchy are possible.” (Specification, p. 4, ll. 18-25)

Thus, the claimed feature hierarchy provides for a more flexible, efficient manner of packet processing, using memory in a more efficient manner as well. This distinction is borne out by comparing the claimed invention with the system disclosed in Uga. Claim 1 recites:

1. A method of processing a packet comprising:
creating a plurality of multi-feature packet processing rules, wherein
said creating comprises, for each multi-feature packet processing rule of said
multi-feature packet processing rules,
forming said each multi-feature packet processing rule by merging a
plurality of features from a feature hierarchy,
each of said features is defined in a feature hierarchy, and
at least one of said features in said feature hierarchy comprise another of said
features in said feature hierarchy, and

populating said plurality of multi-feature packet processing rules in a multi-feature classification memory; and
populating an associated content-addressable memory with a plurality of indices, wherein said indices are indices of said plurality of multi-feature packet processing rules in said multi-feature classification memory,
said content-addressable memory and said multi-feature classification memory are associated with one another by virtue of said content-addressable memory being coupled to provide an index of said indices to said multi-feature classification memory, and
each of said indices corresponds to at least one of said multi-feature packet processing rules.

Claims 9, 17, 24, 32, 40 and 48 now recite similar limitations, having been amended to refine the limitations that capture the distinctions discussed herein, as well as other limitations, as discussed subsequently. As will be appreciated, each of the independent claims clearly recites the forming of multi-feature packet processing rules by merging a plurality of features from a feature hierarchy, wherein each of the features is defined in the feature hierarchy, and at least one of the features in the feature hierarchy comprise another of the features in the feature hierarchy. As noted earlier, this is in marked contrast to the mechanisms described in Uga.

By contrast, Uga provides no such mechanisms. In Uga's system, once a match is found in Uga's content addressable memory, actions thus identified in Uga's system are stored in Uga's search result storage device. No indexing, as in the claimed invention, occurs in Uga. Further, no use is made of anything comparable to the claimed feature hierarchy. Uga's stated purpose, to allow for multiple portions of a bit width wider than Uga's CAM is capable of handling to be processed, a system according to Uga stores the results from each portion of the wide bit width in its search result storage device. Thus, by taking in such information piecemeal, Uga is able to

handle wide bit widths by allowing its CAM to process each portion of the wide bit width separate, and so decide what processing each portion of the wide bit width is intended to produce.

Applicant therefore respectfully submits that Uga's search result storage device does not, in fact, anticipate the claimed multi-feature classification memory for several reasons. For example, the claimed content-addressable memory does not provide any of Uga's information to the claimed multi-feature classification memory for storage therein. Instead, the claimed content-addressable memory provides an index that allows one or more multi-feature packet processing rules to be identified, and so to allow processing of the given packet according to those multi-feature packet processing rules.

Moreover, Applicant respectfully submits that Uga fails to teach the claimed multi-feature classification memory, which is configured to store multi-feature packet processing rules. The claimed multi-feature packet processing rules are, in turn, formed by merging a plurality of features from a feature hierarchy. Each of the features is defined in the feature hierarchy, with at least one of the features in the feature hierarchy comprising another of said features in the feature hierarchy. (Specification, p. 4, ll. 18-25) While the claimed invention employs such mechanisms to more efficiently store and use packet processing rules, Uga remains silent as to both the need for and existence of such approaches. Certainly, in failing to demonstrate any need for such a construct, Uga would therefore not be expected to teach anything comparable thereto. These distinctions, Applicant respectfully submits, are sufficient to distinguish the claimed invention from Uga, and so lead to the conclusion that the claimed invention is allowable over Uga.

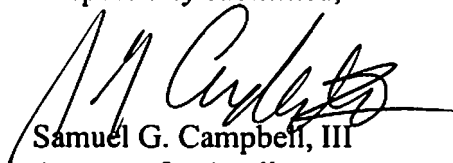
Applicant respectfully submits, therefore, that independent claims 1, 9, 17, 24, 32, 40 and 48 are allowable over Uga and Applicant respectfully urges the Examiner to withdraw the §102 rejection of claims 1-58, due to their dependency on their respective independent claims. Applicant further submits that dependent claims 2-9, 10-15, 18-22, 25-30, 33-38, 41-46, 49-54 and 56-58 are allowable as depending upon allowable base claims in addition to being allowable for various other reasons.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5084.

If any extensions of time under 37 C.F.R. § 1.136(a) are required in order for this submission to be considered timely, Applicant hereby petitions for such extensions. Applicant also hereby authorizes that any fees due for such extensions or any other fee associated with this submission, as specified in 37 C.F.R. § 1.16 or § 1.17, be charged to deposit account 502306.

Respectfully submitted,



Samuel G. Campbell, III

Attorney for Applicants

Reg. No. 42,381

Telephone: (512) 439-5084

Facsimile: (512) 439-5099